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9

DESCRIPTIVE PARTICULARS
OF THE
GREAT EASTERN STEAM SHIP;
WITH
ILLUSTRATIONS
AND
SECTIONAL PLANS.

(By **W. H. WEBB.**)

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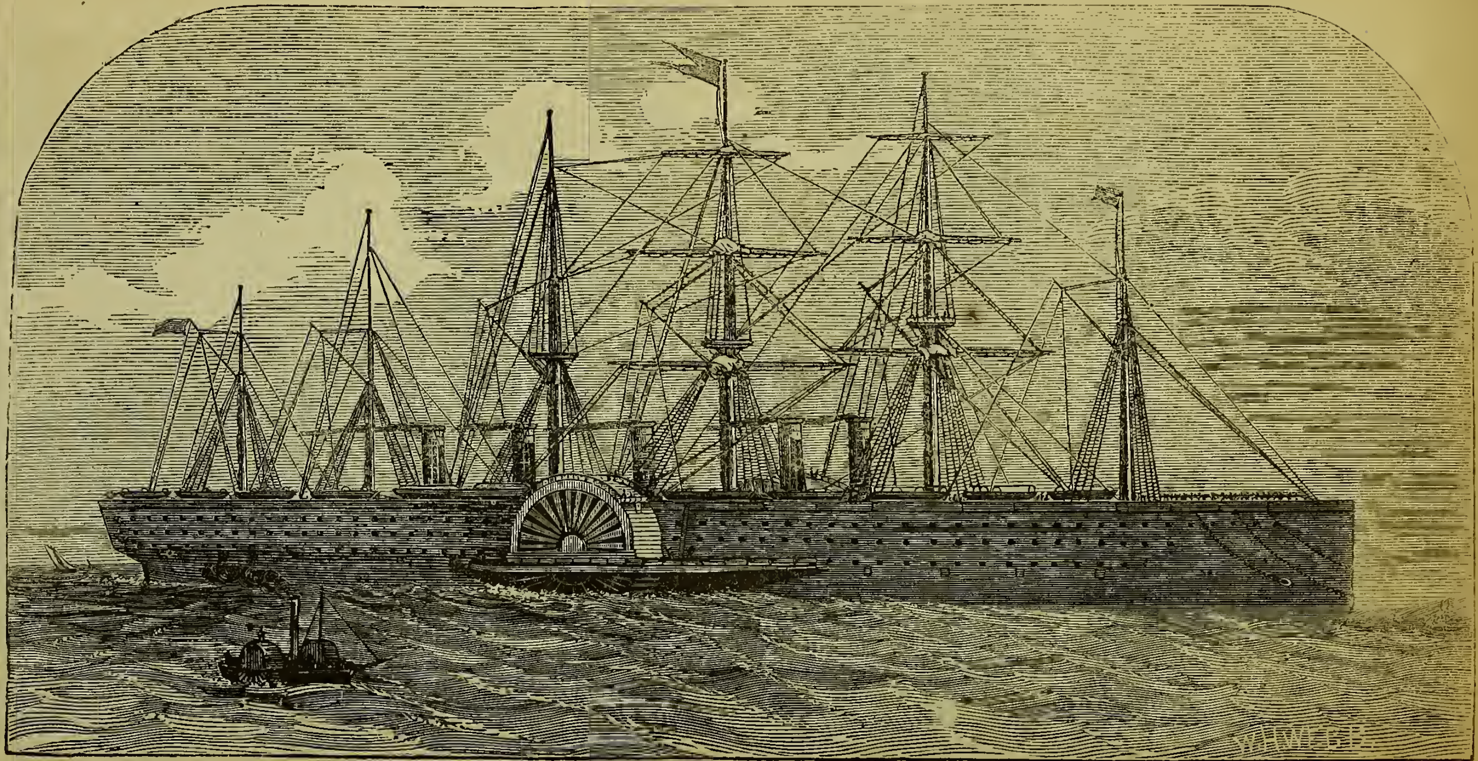

THE 'GREAT EASTERN' OCEAN SHIP.

SCREW, PADDLE, AND SAIL.—FOUR DECKS.

DESCRIPTIVE PARTICULARS

OF THE

"GREAT EASTERN"

STEAM SHIP;

WITH

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1857

THE "GREAT EASTERN"

STEAMSHIP.

Introduction—A Leviathan City.

An eminent writer of fiction has lately been subjected to much ridicule for commencing the introductory chapter of a novel with the sentence, "London is a mighty city." Not that any one disputed the proposition; on the contrary, it was held to be so commonplace a truism, that it was absurd to advance it in a work professing to be original and to contain only brilliant thoughts. But we hold that it is precisely the most universally accepted truisms that are, of all truths, the least understood, and the furthest from being admitted in their full significance. A foreigner, brought up in anti-English prejudices, might doubt that London was so great a city as it is generally thought; but let him come to London, and see with his own eyes its magnitude and its magnificence, and he will have, even from the information picked up during a short visit and after a cursory examination, a juster conception of the greatness of London than the born and bred cockney, who has been from his childhood accustomed to the vastness of its extent, the grandeur of its wealth, and the immensity of its population. The Londoner sees these things every day, becomes habituated to them as matters of course, and overlooks their importance. He requires to be occasionally reminded that the place he lives in is a metropolis of inconceivable vastness of extent, harbouring a population whose numbers may be stated in Arabic numerals, but are too great to be appreciable by our limited comprehension, and whose wealth and intelligence rule the whole civilized world.

We say advisedly, that the numbers are too great for human comprehension. Any man can understand what is meant by a hundred objects or persons. Almost any man can, with his eyes shut, form in his mind a picture of such an assembly as a hundred men would constitute. Any man can understand that a thousand means ten hundred, and that a million is a thousand thousand. But where shall we find the man who can form, or can deceive himself into a belief that he can form, an adequate notion of what a million of men or a million of objects would be? Who can conceive two millions and a half of anything? Two millions and a half of pins;—two millions and a half of sacks of coal; two millions and a half of men! A god, an angel, a demon, a superhuman being of any kind, may comprehend the ideas which these words express; but to a man they are words, mere words;—figures, mere figures. We may reckon them up; we may work sums with them on slates; we may put them in Blue-books—putting millions for units, we may use them in no end of calculations; but our minds cannot grasp them, and (to use, for once, a vile Yankeeism) we are incapable of "realizing" them.

In endeavouring to make the nearest approach we can to a proper understanding of the vastness of this great city, which we have made and cannot appreciate—this giant which, Frankenstein-like, we have created and can neither control nor understand, we must have recourse to two expedients. One of these is to repeat and to dilate upon generalisms. This will be done, this must be done, aye, and it ought to be done while London continues to be as great as it is—continues also to increase. We do not put this forward as an excuse for dwelling upon such generalisms; for feeling that it is right and necessary we should do it, we shall do it without caring to excuse or even to justify it; we merely mention it in its place as one of the points in our general argument. But we take the opportunity of observing that, at the risk of being thought wanting in originality, we shall go on repeating commonplaces, whenever we shall feel that the commonplaces require to be re-stated and enforced.

A Contrast.—The great Achievement of the Age.

Let us go back again to "where we were." There is a second expedient to be resorted to in endeavouring to approach to a just conception of matters too vast to be grasped at once in the whole and in detail. After trying our best to consider the vast and incomprehensible whole, we can take a few of the details, and consider them one by one, bearing in mind all the while that each detail has its relation to the whole. Now, as to the grandeur of London, one of the details which will most help us to a conception of the whole is the wonderful rapidity with which the mere bricks and mortar of the town extend over the surrounding districts. Let us consider this extension in one direction, say towards the north. The writer of these observations is old enough to remember when there were no houses to be seen from the New Road to Highgate. An odd cottage here and there, perhaps, but nothing to call a house. Fifteen years ago the whole district about Chalk Farm was waste or meadow. Where Oakley Square now stands were corn-fields. The greater part of them were in the possession of a dairyman, who kept just ninety-nine cows; and to show how completely rural was the district, a superstition prevailed that this cowkeeper—his name was Rhodes—could not possess one hundred cows. It was generally believed that whenever he purchased one cow beyond the ninety-nine a cow died, reducing the number to ninety-nine again. Those very fields are now not only covered with houses and streets, but are as clearly in London as Fleet Street or Cheapside. In those days people who lived in London went out to spend the day at Chalk Farm or the Swiss Cottage; carried their dinners and their wine or beer in baskets, and made pic-nics in the fields. Those fields are now squares or terraces. Chalk Farm is lost in London, and the Swiss Cottage cannot be seen, because the surrounding buildings do not give room to get a view of it.

Parallel to the grandeur of London is the grandeur of its works. Amongst these is the "Great Eastern." We anticipate the objection that the ship was built at Milwall. The growth of London annihilates small distinctions of space and distance. But we will not argue (as we are half inclined to do) that the Isle of Dogs is in London. It is enough to say that, wherever the work was done, London did it. That being so, let us compare the work which sprang from the town with the town from which the work sprang.

If London is grand in anything it is grand in its shipping. Let the foreigner we imagined at the commencement of these remarks get his first view of the great metropolis from London Bridge. The city of ships that he will there behold will impress him as much with its vastness and grandeur as anything he will see in the city of houses if he lives there for fifty years.

The "Great Eastern" Steam Ship the Lion of London for 1857.

A thousand years ago London was what we should now call a hamlet, built upon a marsh, and surrounded by wide-spreading waters. Hence its name, "Llindyn"—the city in the lakes,—corrupted first by he Romans to "Lyndinum," then to "Lundinum," again to "Londinum," and ultimately by ourselves to London. As the wretched hut to the mansion, as the miserable hamlet to the town, so the ship of these days to the ship of ancient times. A barge on the Thames at Fulham or Vauxhall is a greater edifice, and proof of a better conception of naval architecture, than the war-ships of those days. How has shipping advanced since the times when the boldest navigators feared to lose sight of the shore! How magnificent is the steamer "Waterman No. 10," compared to the galleys in which Cæsar fought with the pirates in the Mediterranean, or from which he landed with his legions on our shores to conquer our barbarous forefathers!

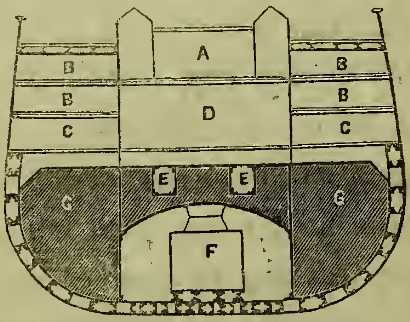
But as the London of ten years ago is to the London of to-day, or as the London of to-day to the London (guessing at the future) we may expect to see in ten years to come, so is the greatest ship we have yet seen to that mighty floating city, that amazing evidence of the grandeur of our nation and of our metropolis, the GREAT EASTERN;—not, indeed, the "eighth wonder of the world," but the one which so eclipses and obscures all the rest, that it must be regarded as the one and only thing that may be regarded as a "wonder." No longer will the "seven wonders" be worth a wonder or even a thought; nor can it be supposed that future works, if ever so much greater, will be greater wonders; for, after this, nothing there can ever be will be wonderful.

Enormous Dimensions of the "Great Eastern."—Her Height and Breadth.

Her length between the perpendiculars is no less than 680 feet; but including her bows, poop and rudder, she is fully 700 feet long, or above an eighth of a mile. The exact length of her upper deck is 692 feet—more than double the extreme length of the deck of the new United States' screw-frigate Niagara, about which our Transatlantic brethren are talking so much. If instead of floating on the water, she were planted on the land, and placed erect, she would rise to an altitude of within 28 feet of double the length of the height of St. Paul's Cathedral.

Her height from the bottom to the underside of the planting of the upper deck is 58 feet; her extreme breadth is 83 feet, the width of one of the widest streets in London—Pall Mall; and her breadth across the paddleboxes is 120 feet—as broad as Portland Place.

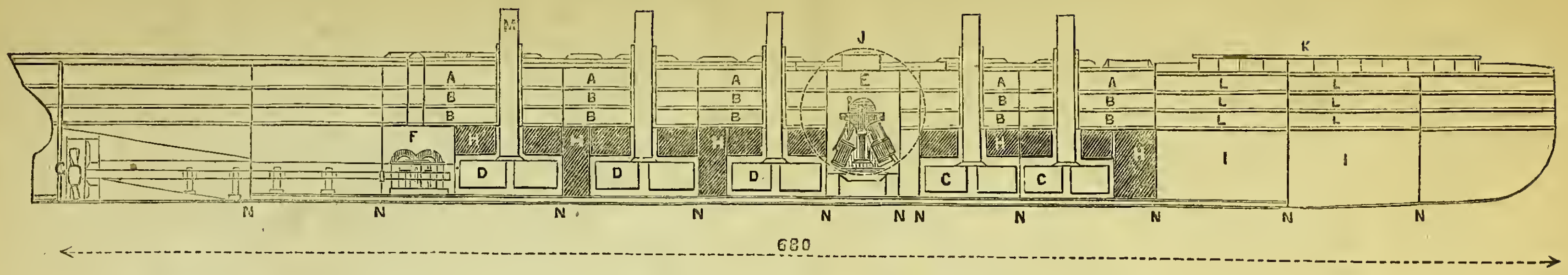
Midship Transverse Section.



A—Upper Saloon.
B—Cabins.
C—Cabins, Baths, &c.
D—Grand Saloon.

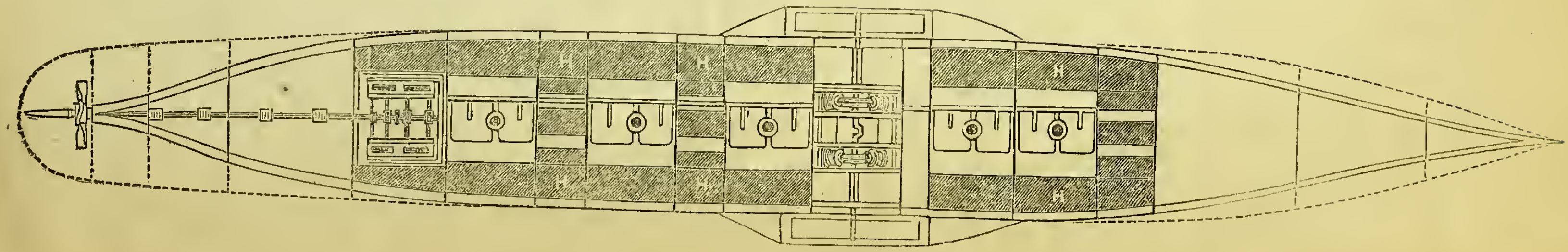
E—Tunnels for Gas and Water Pipes.
F—Boilers.
G—Coals.

LONGITUDINAL SECTION.



A—Upper Saloons.
B—Principal Saloons.
C—Boilers for Paddle Engines.
D—Boilers for Screw Engines.
E—Paddle Engines.
F—Screw Propeller Engines.
G—Screw Propeller.
H—Coal.
I—Space for Cargo.
J—Captain's Rooms.
K—The Forecastle.
L—The Crews Berths.
M—Funnels.
N—Cross Bulkheads.

PLAN OF DECK.



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Comparative Measurement.—The "Ark.'

Such being her length, height and breadth, all the Marlboroughs and Wellingtons, and Merrimacs, and Niagaras in the world are mere cockboats in comparison to her. She is something pre-Adamitic. Even the most wonderful vessel—if vessel it can be called—upon record, for enormous dimensions—Noak's Ark, must yield precedence to her overwhelming magnitude. If the reader will turn to the sixth Chapter of the Book of Genesis, and refresh his memory as to the dimensions of Noah's Ark, and the "fashion" of its making, he will find the description given in these words: "The length of the Ark shall be 300 cubits, the breadth of it 50 cubits, and the height of it 30 cubits." So, reckoning the cubits at a foot and a-half, we have a ship 450 feet long, 75 feet broad, and 45 feet high.

While the visitor is collecting *data* as to ships, sacred and profane, he may turn out "Marlborough" in the Navy List, and there he will see that the largest line-of-battle ship in the British Navy is exactly of 4,000 tons burden. But the iron hull of the "Great Eastern" Steamship is of the burden of within a few tons of 24,000; so that this marvellous vessel is 20,000 tons larger than the largest ship in the world.

It is very difficult for any amount of description to convey an adequate notion of such a vessel. It can only be gained by the visitor himself who goes to the edge of the vessel, and after a careful survey of her, takes a bird's eye view of the large East Indiamen. He will wonder at the diminutive proportions of the latter;—ay, and even of the insignificant size of the immense three-deckers, which are used as 120 gun ships.

The Wonders of Science eclipsed.

It has been observed that among the passions which belong to human nature, we may recognise what may be called a passion for size. Truly, very bold appeals are made to this passion in the works which feed the imaginations of children. In those primitive works of fiction, the writers, dealing always in the superhuman and the supernatural, go straight to the point, and create without ceremony giants who at one step clear seven leagues,—ogres who eat no end of children at one breakfast, and genii whose vast and shadowy forms extend from earth to heaven. But not only do they make men ten or even fifty times bigger than actual men; they make also horses and lions ten or fifty times bigger than real horses and live lions. But this is not the only quarter in which this appalling appeal to the imagination is surprisingly and startlingly made. Science, with all its gravity, copies fiction here, and, in addressing itself to men, appeals to the same passion in exactly the same style as the fairy tale to children. If we take one single ingredient in astronomy—distance, for example—we find that the enormous distances in which astronomy abounds tend more than anything else to create a taste for that science. We find that the figures which represent the distances of heavenly bodies from us, or the speed with which light or electricity travels, have the same fascination for the scientific, that the numbers, the thousands and the hundreds of thousands in the bankers' books, and in the Committees' reports of Joint-Stock companies, have for the covetous imaginations of those whose souls are girt about by the avaricious fiend. The astronomer's set of figures constitutes the conventional symbol for space, and the banker's or Treasurer's set of figures for the potentiality of riches. But whoever wants to feed this natural passion for size in the primitive way, and to see a true giant in its own line, must visit the "GREAT EASTERN."

Amazing Size and Strength of Frame.

We have already given a few figures about her. We must give a few more. Every figure is a monster, and worth looking at separately. Here is one—a figure of **600,000**—it applies to her size in cubical feet. Here is another—a figure of **30,000.** It is the number of the wrought-iron plates which compose the enormous erection. Each plate is fastened by 100 rivets; so that to secure the whole of the 30,000 plates that have been used in her hull, 3,000,000 wrought-iron rivets have been welded in.

From these figures the strength of the whole frame may be imagined. But to give an enormous addition to this strength, the hull, for three feet above the watermark, has been constructed double, on the cellular principle, adopted in the top and bottom of the Britannia Tubular Bridge. The inner hull, or skin, as it is called by shipwrights, is two feet ten inches apart from the outer. In this space, at intervals of six feet, run longitudinal webs of iron plates, which are again subdivided by transverse plates into spaces of about six feet square. At the bottom the longitudinal webs are thicker, and the spaces between them only about three feet square, in order that, whenever it is necessary to ground the vessel for any repairs, she will support her own weight without strain or injury. It is thus seen that the hull is a system of ribs or webs; they are thirty-five in number, present a series of oblong quadrangular openings, and run up to about five feet above deep-water line. The plates which are fitted into these openings are three-quarters of an inch in thickness, and are strongly riveted to the ribs by means of angle-irons. By this system of a double wall, made by a series of iron cells, the maximum of strength is combined with the minimum of material.

Internal Capacity and Arrangements.—Hotels, &c.—10,000 Troops.

The general accommodations and interior arrangements are as follows:—Twelve iron water-tight bulkheads or walls, running transversely, extend the entire height to the upper deck, with openings below the lower deck. The ship is thus cut off into a dozen compartments, any one of which may be filled with water up to the level of the lower deck, without flooding any of the others—a matter of great importance in the event of shipwreck. Near the centre of the ship five of these compartments form five complete hotels for passengers; for each compartment, like Noah's ark, comprises upper and lower storeys, divided into saloons, bedrooms, bar, offices, &c., and each is partitioned off from the other by the iron bulkheads. It is as if five hotels were let down into an equal number of vast iron boxes. The dimensions of these five saloons are thus arranged:—those on the lower deck are 13 feet 8 inches high, and those on the upper deck 12 feet. The upper saloons are 70 feet, and the lower saloons 60 feet long. Vertical longitudinal walls separate each compartment into central cabins, or saloons, and side-cabins or bedrooms; and decks separate the height into two series of such rooms. These arrangements are intended to accommodate 4,000 passengers; 800 of whom are first class, 2,000 second class, and 1,200 third class. On an emergency the ship could carry 10,000 troops.

The crew and engineers, 350 in number, will be accommodated near the two ends of the vessel. The length of the forecastle is 140 feet, and its height 8 feet.

The internal arrangements are thus planned with an amount of room and comfort for each of the crew and passengers never attempted in other ships; and the deck, which is flush fore and aft, except where there are skylights and ventilating openings, presents a promenade nearly 700 feet in length; so that a promenade once round the deck will afford a walk of a quarter of a mile. The deck has an iron basis, double and cellular, like the hull. The thickness of the iron plates is the same as in the bulkheads, viz., half an inch; not so thick as the iron plates used in the inner and outer skins, which are of full three-quarters of an inch.

Machinery, Weight, and Horse Power.

This monster ship combines steam power in both shapes, screw and paddle, with sailing power. She contains 10 boilers and 112 furnaces. The cylinder of the paddle engines are 6 feet in diameter, and weigh five times as much as the great bell of St. Paul's. The screw propeller is 24 feet in diameter, and the diameter of the paddle-wheels is 56 feet, or considerably larger than the circus at Astley's Amphitheatre, with float boards 13 feet in length; these paddlewheels are driven by engines with four cylinders, the largest ever made on the oscillating principle, having a stroke of 14 feet: the weight of each is 26 tons. The engines stand nearly 40 feet high, and were made by Messrs. Scott Russell.

The screw engines are driven by the same number of cylinders. The cylinders are 7 feet in diameter, and weigh each 30 tons, having a stroke of 4 feet. They are the largest ever made for marine purposes, and were manufactured by Messrs. Watt, of Soho. The screw propeller has four fans or vanes, is 24 feet in diameter, has a shaft 160 feet long, and weighs 130 tons.

The weight of the ship and engines will be about 12,000 tons. Each cylinder for the paddle engine required 34 tons of molten metal in the casting.

The paddle engines are of 1,000 horse power, and the screw engines of 1,600 horse power, giving a total of 2,600 horse power, at a pressure of 25 lbs.; though, of course, if necessary, they can work to a force of upwards of 10,400 horses.

Rigging and Anchors.

In addition to these facts, we may add that the monster has 6 masts and 10 anchors. All the former are of hollow wrought iron, except the last or mizen mast, on which, at a height of 7 feet from the deck, is placed the compass. The masts spread together no less than 6,500 square yards of canvas; though having no bowsprit, the ship can, of course, carry no spritsail. Three of the masts are square-rigged with iron spars, except the upper topsail yards. The rigging is of wire, and the large shrouds of this material are eight and a half inches in circumference. Sails are not needed in the ordinary state of the weather, and only take advantage of a very brisk wind in a favourable direction, and assist in steadying and steering. To aid the three hundred and fifty sailors and engineers in working the ship, there are auxiliary steam engines, from which power may be laid on for hoisting sails, heaving anchors, working pumps, &c. There are 800 fathoms of chain cable, and numerous capstans and warps.

Auxiliary Boats.

She carries 20 large boats on deck. In addition to these she also carries, suspended aft of her paddleboxes, and hung on davits, two small screw steamers 100 feet long each, and of between 60 and 70 tons burden. These are raised and lowered by the small auxiliary engines, mentioned as fixed on board for the purpose of pumping, hoisting sails, and weighing anchor. Both the little screws are kept in all respects perfectly equipped for sea, and ready for the onerous service of embarking and landing the passengers, with all their luggage, &c. along-side the wharf or pier, whichever it may happen to be.

Tonnage of Coal and Stowage.

The quantity of coal which can be carried for long voyages is 12,000 tons, which is ingeniously packed around and above the boilers, so as to be near at hand.

Two longitudinal bulkheads run fore and aft at a distance of 36 feet apart for a length of 350 feet, and the under half of the ship is divided by several iron partitions and arches, as well to strengthen the structure as to accommodate the machinery.

The four boilers which supply steam for the paddle engines, and the six which supply steam for the screw, are so enormous, that they look like houses. Each weighs 45 tons or upwards, and works at a pressure of 25lbs. to the square inch. Each boiler has been tested by an hydraulic pump, with a force of upwards of 60lbs. per square inch, and a pressure of 100lbs. might have been applied with safety.

There are 40 furnaces for the 4 boilers for the paddle engines, and 60 furnaces for the 6 boilers for the screw engines, making an aggregate of 112 furnaces. These furnaces are so constructed as to burn either anthracite or common steam coal. To facilitate the passage of the workmen, iron tunnels, rendered every where water-tight, are constructed through the coal bunkers and the transverse bulkheads, or iron partitions, which form impenetrable barriers between the compartments.

Electric Telegraph.

An electric telegraph will be placed on board for communicating orders to the various parts of the ship, from the captain of this gallant steamer, to the engineer, the helmsman, and the look-out men. The gas by which she is to be lighted will be made on board, and the Electric Light will flicker like St. Elmo's fire at night from her mast head.

Realizes a speed of 20 miles an hour.

She will realize a speed of at least 16 knots, or 20 miles an hour, and will accomplish the voyage from England to Australia, or India, by the Cape of Good Hope, in 30 to 35 days.

The weight of the whole ship, when voyaging, with every contemplated article and person on board, will not be less than 25,000 tons. At full load she will draw about 30 feet of water. But though this is her maximum in draught when fully laden, her ordinary draught will be about 22 feet; so that she towers above the surface of the water to the height of 30 feet.

Projectors.

Reckoning the cost at per ton, she will be one of the cheapest steam-vessels yet constructed. The history of her building is singular, and there are several persons who have a share in the merit and responsibility of her construction.

To Mr. Scott Russell are due her merits as a piece of naval architecture, for he designed her lines, and constructed her iron hull. Her lines and her structure being identical with those other ships, constructed on a principle of his own, which he has systematically carried out during the last two years, and which is commonly called the "wave" principle.

The paddle-wheel engines, of 1000 horse-power, by which she is propelled, were made by Mr. Scott Russell; but Messrs. James Watt & Co., the eminent engineers of Soho, have the entire merit of the design and construction of the engines of 1,600 horse-power, which propel the screw.

It is, however, to the engineer of the Eastern Steam Navigation Company, Mr. J. K. Brunel, that the original conception is due of building a steamship with these main characteristics which distinguish the "Great Eastern" from all other ships—large enough to carry coals sufficient for full steaming on the longest voyage; using two sets of engines, and two modes of propulsion, and having a cellular construction like that at the top and bottom of the Britannia Tubular Bridge, introduced into her structure.

Mr. Brunel, at the outset, and long before his views assumed a mercantile form, communicated them to Mr. Scott Russell, and that gentleman participated in the contrivance of the best means to carry them into practical effect.

There are others whose names and services in this matter the public should not forget whenever the great ship is mentioned.

Difficulties encountered.

The mercantile difficulty appeared at the onset, and it proved afterwards to be quite as great as the mechanical difficulty of the undertaking. So unusual an enterprise could not have been carried out without ability, energy, and prudence; and to the credit of all this the Board of Directors of the Eastern Steam Navigation Company, represented by their Chairman, H. T. Hope, Esq., and their Secretary, Mr. John Yates, are entitled in a high degree. One of them bore the burden and heat of the day, and at the outset of the undertaking was one of its most able and zealous supporters—Mr. Charles Geach. That gentleman is now dead; but without him the enterprise would never, as a mercantile speculation, have been undertaken by many of those who did undertake it. On his aid and exertions many of them, probably, and Mr. Scott Russell has said, certainly himself, relied mainly for the successful issue of the undertaking; and his untimely death materially increased the difficulties of the undertaking, both to the Directors, and to the constructor of the ship.

In the construction of the hull and the paddlewheel engines, Mr. Scott Russell was assisted by Mr. Dickson and Mr. Hepworth.

Visit to and Inspection of the "Great Eastern."

The rigging and masting, the cabin and fittings, are executed under Mr. Brunel, Mr. John Yates, and Captain Harrison, and the other officers of the Eastern Steam Navigation Company.

While this Leviathan ship has been in progress, she has been visited by many of the most eminent men of the day. It is difficult, if not impossible, for the mind to appreciate and realize its immense bulk at once. You do not get a glimpse of it till you enter the yard, when, though the ship was still at a considerable distance, it seemed suddenly to shut you in—a mountain of metal across your path—while all around were scattered ponderous masses of girders, funnels, bulkheads, boilers and machinery, like the ruins of some colossal iron world. So vast is the bulk of the huge ark, that from no one point, save at the river's side, could the eye take in its whole proportions, and even then its immensity was so great, in comparison with all the notions previously conceived of monster ships, that it seemed to elude comprehension and weigh upon the mind—a kind of iron nightmare—a phenomenon, hard and unrealizable. It was useless looking at it, so you tried by details to bring the mind to an approximation of its size, and wandered about the yard in search of familiar objects, which might restore to their equilibrium your disordered ideas of proportion. On the ground lay something like a field of red iron, with a kind of hedge of the same material all round it, and on this you walked, until you found it to be the bulkheads of watertight compartments, and which were lifted bodily 100 feet in the air, and placed in the hull of the ship. Again disturbed in your fancies, you sought refuge in the contemplation of a labyrinth of spokes and stays, a semicircle of iron like the supports of a building wider across than King

William Street, larger than the circus at Astley's, and which instinct soon told you was nothing less than part of one of the great ship's paddlewheels.

By this time, half used to the Brobdignaggian world around, you could coolly walk down a couple of long iron tunnels, which in lightness, cheerfulness, and general population, reminded you forcibly of the Burlington Arcade. You knew these were two out of five of the ship's chimneys, but became reconciled to the fact, and felt on the whole they were quite what you expected. So with a row of red buildings, which at first looked like houses, and seemed the iron suburbs of the vast edifice which towered above you. These were the boilers, though the wildest ideas as to their use seemed to pervade the mass of visitors who peeped in at the manholes. They were evidently looked upon (especially by the ladies) as mere iron technicalities, quite distinct from the ship, though useful in some remote and unexplained degree—probably as models, or as adjuncts to the captain's toilet!

The sight of such objects as these around gradually restored your mind, and predisposed you for appreciating bulk at least. You somehow expected to find everything large, and in keeping with the "monster of the deep," and turned with disappointment from the aspect of tall factories and large trees, which were dwarfed to things of paltry insignificance. In this frame of mind, if you had been told that the steam cradle,—which high over all, in a massive framework of oaken beams, lifted up the boilers and other sundries,—had been fixed there for the purpose of hoisting in the ship's telescope, you would have taken the information as a matter of course, and been in no way surprised or moved at the announcement.

In going to the ship itself, you were in no hurry to mount its lofty sides. Built near it was a tall framework, or rather a wooden tower, by means of which, after toiling up a flight of ninety-four steps, you gained the deck at last.

Imposing View of the Deck.

Here, no matter how much the previous sights might have prepared the ideas, the ship viewed from the deck as one great whole—or, rather, as much of the great whole as might be seen, for all could not —was quite beyond the grasp of an ordinary comprehension. In fact, it was like anything but the deck of a ship, though nothing but the deck of *the* ship was like it. The reader might probably have been on the roof of the Crystal Palace or Great Exhibition while building. Let him recal either of those scenes—the webs of scaffolding, the groups of forges, the cradles and winches, the girders, pillars and plates, the white-heat rivets, the punching machines, the monstrous screws, and, above all, the bellowing din of by no means distant thunder, and he can form some idea, though a faint one, of the deck of the "Great Eastern." Peering cautiously over the edge of the space where the upper and lower saloons for the cabin passengers were to be constructed, you seemed as if you were looking from a house-top into some ordinary metropolitan square, or the court of an extensive French hotel, at the bottom of which even the noise of the workmen was subdued, for they were sixty feet beneath the spectator !

Idea of the "Great Eastern" Afloat.

Let us imagine the "Great Eastern" afloat, and on her passage to Bombay or Melbourne, and with her ordinary complement of passengers on board. The first idea which strikes us is the multitude of faces on board. It is, in fact, a whole town afloat, and much more than a town of 4,000 population, because it is a floating town of 4,000 grown-up persons; at least, with comparatively few exceptions, each of them being what is called an "individual,"—by which we mean a human being of size to command notice, and having, to appearance, at least, a mind and will of his own, together with a formed air, tone and manner peculiar to himself. In this sense even young ladies are individuals.

All this crowd of individualities are collected within the dimensions of 700 feet by 83. What a new shape of human society! Take the 800 first-class passengers by themselves, and what room does even this number afford for the formation of all kinds of different circles and sets, which know nothing of each other, one man only just knowing another by sight, and hardly that! How many immeasurable social chasms collected within a few hundred feet. How many Mr. Smiths who will not speak to Mr. Jones during the whole voyage, because he is not in the same set! How many Mr. Joneses paying back Mr. Smith in the same coin! Between how many "nice" young ladies and "proper" young gentlemen is a great gulf fixed, because, in the eyes of anxious mothers, the said young gentlemen are not desirable persons, but mere penniless bipeds! What flirtations there will be behind boats!—what rivalries! And if many Americans voyage by the "Great Eastern," what duellings may we not expect on that ample deck! In short, what an epitome or camera-obscura of the world will the "Great Eastern" present.

It will be worth any aspiring novelist's while to take his berth to Australia or India and back again, simply for the great convenience of having so much human nature brought before him within so small a compass. It will be the mountain brought to Mahomet,—the world condensing itself before his eyes, for the sake of being observed and examined. The rapid succession of faces will bewilder him at first; but individuality will come out in time, though he must be sharp about his work, otherwise the "Great Eastern" will have stopped her screw and paddles before he has got any results. If his material is enlarged, his time is much curtailed on the new system. Farewell to long voyages, with their appropriate quarrels and matches—their love-makings, jiltings, reconciliations and irrevocable unions;—voyage life has entered on another phase. For what is a month? It is gone before we begin to think about its going. How will the old voyagers look back to the romantic days, when a roomful of persons were their own company for four months, gradually forming enmities or friendships,—when attachments rose up among young people unconsciously, and by the mere passive influence of the scene. We are growing a busier nation every year, and cannot afford time for more than one chapter of this sea romance.

The Grand Results of the Swift Voyages of the "Great Eastern."

But we must not let the appeal to imagination supersede the real practical result of the grand experiment of the "Great Eastern." The Roman Poet, Horace, as he surveyed this vast sublunary scene of restless industry and adventure, was struck by nothing so much as the triumph of man over the sea. He expresses himself as more than struck,—as *shocked*. He argued that the sea was a providential appointment, and that it was impious in man to struggle against it,—he had no right to unite what God had separated, and connect land with land, when the Divine power had inserted water between. We have long since seen the weakness of this argument, and arrived at a much better doctrine of final causes than this. But if any one wants to see a good finishing blow given to the Horatian argument—at least on the *Solvitur ambulando* principle—he may see it given by the "Great Eastern." That mighty fabric, indeed, does not talk, but it acts—its act being a month's voyage to India or to Australia. That act, while it is a speechless, is, at the same time, the most powerful answer that the religious scruples of the awe-struck poet could receive. A reflecting mind will see in such a voyage a much more natural, proper, wise, and obedient fulfilment of the designs of Providence, than any timid self-confinement and servile deference to a barrier of nature would have been. It will appear that the sea was made to alternate with the dry land, not that continents might be disconnected, but that man should have the opportunity of exerting his skill and invention in connecting them. The result of this great experiment of ship-building, if it answers—of which there is little or no doubt—will be a consolidation of the British Empire such as we have never yet seen. Half of the space which separates the various sections of it from the mother country and from each other will be annihilated. Our colonies will be brought comparatively close to us, and what is almost of as much importance as the actual vicinity gained, they will be more than twice as near to us in imagination. The difference between a month's voyage and two or three months is all the difference to the imagination. We think of a place as within reach, and within a home distance, if it is only "a month off." The whole empire is thus brought into a home compass, and obtains the addition of strength which so much greater union gives. We shall find ourselves paying visits to, and receiving visits from, India and Australia. Our friends will come over for the summer with return tickets, and the British Empire will become, in virtual compass, a province.

Launching.

The great length of the vessel has rendered necessary the adoption of a new plan for launching. In ordinary circumstances, a ship is built on a sloping ground or slip, with a descent of about one foot in fourteen towards the water side ; but in this instance the vessel is built on a level, broadside towards the river. For launching, two timber platforms of immense strength are formed, from the ship's position to low-water mark; each platform eighty feet in width, smooth at the top, and having a slope towards the water of one in twelve, is supported by a vast substructure of piles driven into the ground. Two cradles of massive timber are built temporarily under the hull, one between the midship and the head, the other between the midship and the stern; and when all subsidiary arrangements are ready, these two cradles slide down the two platforms, carrying the monster-ship—*twenty million pounds-weight*—with them. This is done at low-water, and the rising tide floats the vast fabric.

The contractors, Messrs. Tredwell, of Gloucester and Bristol, have undertaken the excavation, piling, and other works necessary for the foundation of the launching ways. Esam, of Gloucester, has a very clever and ingenious pile-driver, capable of driving twenty piles a day, which is in use preparing for the launch.

The first Steamer on the Thames

Ran between Gravesend and London in 1816, called the Margery seventy tons burden, and fourteen horse-power.

Enterprise of Ship Builders.

The following list of Steamers, built at different dates, show the advantages great length of hull have in attaining speed.

		Length.	Breadth.
1825	Enterprise (built for India) . . .	122 ft.	27 ft.
1835	Tagus (first Mediterranean steamer) . .	182 „	28 „
1838	Great Western (first Atlantic steamer) .	236 „	36 „
1844	Great Britain (first ocean screw-steamer) .	322 „	51 „
1853	Himalaya (largest screw-steamer) . .	370 „	44 „
1856	Persia (longest paddle-steamer) . . .	390 „	45 „

The largest war-steamer now (1857) afloat, the *Duke of Wellington*, is shorter than the *Persia* by no less than 150 feet; whereas it is 9 feet broader than the broadest merchant-steamer. This illustrates the difference in qualities required for war and for mail-transit.

Route.

The direct route is by the Blackwall Railway. Trains run from the Fenchurch Street Station to Limehouse every quarter of an hour; from thence by Saul's omnibusses, which wait the arrival of each train to convey visitors direct to the ship, during the hours of admission.

Admission.

Visitors are admitted to view the "Great Eastern" Steam Ship, on Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays from one to half-past one; retiring at two o'clock; and on Saturdays from half-past three to half-past four, retiring at half-past five.

Tickets, 2s. 6d. each, may be had of Messrs. Marshall & Sons, Paddington, Fenchurch Street, and at 48, Leadenhall Street, City.

General Description of the "Great Eastern."

Length 680 feet, upper deck 692 feet.

Breadth 83 feet, including paddleboxes 118 feet.

Height of the hull 60 feet.

Weight of the whole Ship when voyaging, estimated to carry 25,000 tons.

When loaded full will draw 30 feet of water.

10,000 troops can be accommodated on board this Ship.

The Ship is fitted up for 800 first-class passengers, 2,000 second, and 1,200 third-class.

6 masts, carrying 6,500 square yards of canvas.

10 anchors, 800 fathoms of chain cable.

The crew and engineers consist of 350.

The principal saloons measure about 400 feet in length.

Weight of anchors, cables, &c.,	253 tons
Plates of iron, used in the construction of the hull	30,000
Number of rivets used in fastening the plates	3,000,000
Weight of iron used in the construction, about	10,000 tons
To carry coals and cargo	18,000 tons
Nominal power of paddle engines	1,000 horses
Ditto, screw ditto	1,600 horses
Number of cylinders of paddle-engines	4
Diameter of cylinders	74 inches
Length of stroke	14 feet 6 inches
Length of shaft of screw propeller	160 feet
Weight of ditto	130 tons
Diameter of screw propeller	24 feet
Number of boilers	10
Ditto of furnaces	112

Bateman and Diprose, Printers, 19, Cursitor Street, Chancery Lane.